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EXAMINER	
ZEWDU, MELESS NMN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/747,143	Applicant(s) KROEGER ET AL.
	Examiner Meless N Zewdu	Art Unit 2683

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40 and 42-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *37 and 55-62* is/are allowed.

6)☒ Claim(s) *21-36, 38-40, 42-54 and 63-69* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment (B)

1. This action is the first on the merit of the instant application.

2. The original claims 1-20 have been cancelled in the current preliminary amendment.

3. Claims 21-69 are pending in this action.

4. The objection to the Abstract has been withdrawn since applicants have addressed the problem therein.

5. Objections to claims 45 and 66 have been withdrawn since applicants have amended the claims and overcome the objected features in those claims.

6. The double patenting rejection over the U.S. Patent No. 6,178,317 B1 has been withdrawn since applicants filed Terminal Disclaimer (see paper 9).

7. This action is final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21-30, 35-36, 42-44, 49-54 and 63-69 are rejected under 35 U.S.C. 102(e) as being anticipated by Kumar (US 5,949,796)..

As per claim 21: a method of in-band on-channel broadcasting comprising the steps of:

providing an analog signal to be broadcast reads on '796 (see col. 1, lines 8-14; col. 78, lines 35-59).

providing a digital signal to be broadcast reads on' 796 (see col. 26, line 30-col. 27, line 12).

delaying said digital signal with respect to said analog signal reads on '796 (see fig. 4, element 45; col. 38, lines 26-58).

modulating a first carrier with said analog signal reads '796 (see col. 1, lines 8-13).

orthogonal frequency division modulating a plurality of sub-carriers with said digital signal, said plurality of sub-carriers being positioned in upper and lower sidebands with respect to said first carrier reads on '796 (see col. 26, lines 31-51).

combining said first carrier and said plurality of sub-carriers to produce a composite signal reads on '796 (see col. 1, lines 4-24; col. 78, lines 35-55). The phrase existing together, in the sited section, indicates compostion.

transmitting said composite signal reads on '796 (see col. 1, lines 4-13; col. 78, lines 35-55).

As per claim 22: a method of in-band on-channel broadcasting wherein said analog signal and digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 23: a method of in-band on-channel broadcasting wherein:

said carrier is frequency modulated reads on '796 (see col. 39, lines 33-49; col. 40, lines 30-53; col. 78, lines 35-55).

said upper sideband ranges from about 130kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

said lower sideband ranges from about –130 kHz to about –199 kHz from said carrier reads on '796 (see col. 26, lines 52-67).

As per claim 24: an in-band on-channel broadcasting transmitter comprising:

means for providing an analog signal to be broadcast reads on '796 (see col. 1, lines 8-14; col. 78, lines 35-55).

means for providing a digital signal to be broadcast reads on' 796 (see col. 26, line 30-col. 27, line 12).

means for delaying said digital signal with respect to said analog signal reads on '796 (see fig. 4, element 45; col. 38, lines 26-58).

means for modulating a first carrier with said analog signal reads on '796 (see col. 1, lines 8-13).

means for orthogonal frequency division modulating a plurality of sub-carriers with said digital signal, said plurality of sub-carriers being positioned in upper and lower sidebands with respect to said first carrier reads on '796 (see col. 26, lines 31-51; col. 43, lines 7-42)

means for combining said first carrier and said plurality of subcarriers to produce a composite signal reads on '796 (see col. 78, lines 35-55).

means for transmitting said composite signal reads on '796 (see col. 78, lines 35-55).

As per claim 25: an in-band on-channel broadcasting transmitter wherein said analog signal and said digital signal represent the same audio information reads on '796 (see col. 78, lines 35-58). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 26: an in-band on-channel broadcasting transmitter wherein:

said first carrier is frequency modulated reads on '796 (see col. 39, lines 33-49; col. 40, lines 30-53; col. 78, lines 35-55).

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on ‘796 (see col. 26, lines 52-67).

As per claim 27: a method of receiving an in-band on-channel composite broadcast signal including a first carrier modulated by an analog signal reads on ‘796 (see fig. 9, element 202; col. 55, lines 48-52), a plurality of sub-carriers positioned in upper and lower sidebands with respect to said first carrier and orthogonal frequency division modulated by a digital signal reads on ‘796 (see col.58, line 50-col. 59, line 24), wherein said analog signal is delayed with respect to said digital reads on ‘796 (see col. 59, line 58-col. 60, line 30) said method comprising the steps of:

demodulating said first carrier to produce a first demodulated signal reads on ;796 (see abstract; col. 30, lines 36-58; col. 77, line 62-col. 78, line 2; col. 78, line 56-col. 79, line 3)

demodulating said plurality of sub-carriers to produce a second demodulated signal reads on ‘796 (see col. 78, lines 55-59).

delaying said second demodulated signal with respect to said first demodulated signal reads on ‘796 (see fig. 9, element 229; col. 59, line 58-col. 60, line 30; col. 77, lines 13-20).

selecting one said first and second demodulated signals to be used to produce an output signal reads on ‘796 (see col. 77, line 41-col. 78, line 10; col. 78, line 36-col. 3; and

producing an output signal in response to the selected one of said first and second demodulated signals reads on ‘796 (see col. 78, line 56-col. 793).

As per claim 28: a method of receiving an in-band on-channel broadcast signal, wherein said analog signal and said digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 29: a method of receiving an in-band on-channel broadcast signal, wherein:

said first carrier is frequency modulated reads on '796 (see col. 39, lines 33-49; col. 40, lines 30-53; col. 78, lines 35-55).

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

As per claim 30: a method of receiving an in-band on-channel broadcast signal 27, wherein said step of selecting one said first and second demodulated signals to be used to produce an output signal comprises the step of:

detecting degradation of one said first and second demodulated signals by determining one or more parameters selected from the group consisting of signal-to-noise ratio, bit error rate, signal power level and cyclic redundancy check reads on '796 (see col. 34, lines 52-65; col. 57, lines 36-56). Since only one of the cited parameters is selected to be utilized at any given time, only one requirement needs to be satisfied and the prior art satisfies that by disclosing (SNR).

As per claim 35: a method of transmitting a broadcast signal, comprising the steps of:

providing a first digital broadcast signal reads on '796 (see fig. 4, element 47; col. 26, line 36-col. 27, line 29).

generating a second digital broadcast signal that is delayed in time with respect to the primary broadcast signal, the second digital broadcast signal having a lower data rate than the first digital broadcast signal reads on '796 (see fig. 4, element 49; col. 26, line 36-col. 27, line 29; col. 47, lines 24-44).

combining the first digital broadcast signal and the second digital broadcast signal to form a composite signal reads on '796 (see fig. 4, element 59; col. 26, lines 52-64).

transmitting the composite signal reads on '796 (see fig. 4, element 67; col. 27, lines 1-12).

As per claim 36: a method of transmitting a broadcast signal wherein:

said first digital broadcast signal is used to modulate a first plurality of sub-carriers within a broadcast channel reads on '796 (see col. 26, line 36-col. 27, line 24). The upper sideband sub-carrier could considered as the first digital broadcast signal.

said second digital broadcast signal is used to modulate a second plurality of sub-carriers within the broadcast channel reads on '796 (see col. 26, line 36-col. 27, line 24). The lower sideband sub-carrier could considered as the second digital broadcast signal.

As per claim 42: an in-band on-channel broadcasting transmitter comprising:

an input for receiving an analog signal to be broadcast reads on '796 (see fig. 4, element 79).

an encoder for providing a digital signal to be broadcast reads on '796 (see fig. 4, element 41).

a time delay for delaying said digital signal with respect to said analog signal reads on '796 (see fig. 4, element 45; col. 39, lines 13-32; col. 77, lines 13-20).

a first modulator for modulating a first carrier with said analog signal reads on '706 (see fig. 4, element 65; col. 40, lines 44-67).

a second modulator for orthogonal frequency division modulating a plurality of sub-carriers with said digital signal, said plurality of sub-carriers being positioned in upper and lower sidebands with respect to said first carrier reads on '796 (see fig, 4, elements 47 and 49; col. 39, line 33-col. 40, line 29; col. 78, lines 35-59).

a combiner for combining said first carrier and said plurality of sub-carriers to produce a composite signal reads on '796 (see col. 39, line 33-col. 40, line 29; col. 78, lines 35-55).

and an antenna for transmitting said composite signal reads on '796 (see fig. 4, element 67; col. 78, lines 35-55). See means for transmitting.

As per claim 43: a n in-band on-channel broadcasting transmitter, wherein said analog signal and said digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to

the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 44: a n in-band on-channel broadcasting transmitter, wherein:

said first carrier is frequency modulated reads on '796 (see col. 39, lines 33-49; col. 40, lines 30-53; col. 78, lines 35-55).

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

said lower sideband ranges from about –130 kHz to about –199 kHz from said carrier reads on '796 (see col. 26, lines 52-67).

As per claim 49: A method of in-band on-channel broadcasting comprising the steps of:

providing a first digital signal to be broadcast reads on '796 (see fig. 4, element 47; col. 26, line 36-col. 27, line 29).

providing a second digital signal to be broadcast, said second digital signal having a lower data rate than said first digital signal reads on '796 (see fig. 4, element 49; col. 26, line 36-col. 27, line 29).

delaying said second digital signal with respect to said first digital signal reads on '796 (see fig. 4, element 49; col. 26, line 36-col. 27, line 29).

orthogonal frequency division modulating a first plurality of subcarriers with said first digital signal, said first plurality of subcarriers being positioned in upper and lower sidebands with respect to said first carrier reads on '796 (see col. 74, lines 10-46).

orthogonal frequency division modulating a second plurality of subcarriers with said second digital signal reads on '796 (see col. 74, lines 10-46). According to the

reference, both the upper and lower side bands are orthogonal frequency division modulated.

combining said first and second plurality of subcarriers to produce a composite signal reads on reads on '796 (see fig. 4, element 59; col. 26, lines 52-64); and

transmitting said composite signal reads on '796 (see fig. 4, element 67; col. 27, lines 1-12).

As per claim 50: a method of in-band on-channel broadcasting, wherein said first digital signal and said second digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 51: a method of in-band on-channel broadcasting, wherein:

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67).

As per claim 52: an in-band on-channel broadcasting transmitter comprising:

means for providing a first digital signal to be broadcast reads on '796 (see fig. 4, elements 51 and 47; col. 26, line 31-col. 27, line 12).

means for providing a second digital signal to be broadcast reads on '796 (see fig. 4, element 49; col. 26, line 31-col. 27, line 12).

means for delaying said second digital signal with respect to said first digital signal reads on ‘796 (see fig. 4, element 45; col. 39, lines 4-32).

means for orthogonal frequency division modulating a first plurality of sub-carriers with said first digital signal, said first plurality of sub-carriers being positioned in upper and lower sidebands with respect to said first carrier reads on ‘796 (see fig. 4, element 47; col. 26, line 31-col. 27, line 29; col. 42, line 11-col. 43, line 47).

means for orthogonal frequency division modulating a second plurality of sub-carriers with said second digital signal reads on ‘796 (see fig. 4, element 49; col. 26, line 31-col. 27, line 29; col. 42, line 11-col. 43, line 47).

means for combining said and second plurality of sub-carriers to produce a composite signal reads on ‘796 (see fig. 4, element 59; col. 26, line 36-col. 27, line 12).

means for transmitting said composite signal reads on ‘796 (see fig. 4; col. 26, line 52-col. 27, line 12).

As per claim 53: an in-band on-channel broadcasting transmitter, wherein said first digital signal and said second digital signal represent the same audio information reads on ‘796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3).

As per claim 54: an in-band on-channel broadcasting transmitter, wherein:

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on ‘796 (see col. 26, lines 52-67). The range of frequencies in the reference includes the claimed range of frequencies.

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The range of frequencies in the reference includes the claimed range of frequencies.

As per claim 63: an in-band on-channel broadcasting transmitter comprising:

an encoder for providing a first digital signal to be broadcast and a second digital signal to be broadcast reads on '796 (see fig. 4, element 41; col. 36, lines 5-27).

a time delay for delaying said second digital signal with respect to said first digital signal reads on '796 (see fig. 4, element 45; col. 38, lines 26058).

a modulator for orthogonal frequency division modulating a first plurality of sub-carriers with said first digital signal, said first plurality of sub-carriers being positioned in upper and lower sidebands with respect to said first carrier and for orthogonal frequency division modulating a second plurality of sub-carriers with said second digital signal reads on '796 (see fig. 4, elements 47 and 49; col. 38, lines 21-58).

a combiner for combining said and second plurality of sub-carriers to produce a composite signal reads on '796 (see fig. 4, element 59; fig. 5, element 93; col. 38, lines 3-20).

an antenna for transmitting said composite signal reads on '796 (see fig. 4; col. 26, line 36-col. 27, line 12; col. 39, lines 50-52).

As per claim 64: an in-band on-channel broadcasting transmitter, wherein said first digital signal and said second digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3).

According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 65: an in-band on-channel broadcasting transmitter, wherein:

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

As per claim 66: a receiver for an in-band on-channel broadcast signal including a first plurality of sub-carriers positioned in upper and lower sidebands of a broadcast channel and orthogonal frequency division modulated by a first digital signal, and a second plurality of sub-carriers orthogonal frequency division modulated by a second digital signal, wherein said second digital signal is delayed with respect to said first digital signal, said receiver comprising reads on '796 (see fig. 4; fig. 9; elements 213 and 215; col. 26, line 36-col. 27, line 26).

a demodulator for demodulating said first plurality of sub-carrier to produce a first demodulated signal and for demodulating said second plurality of sub-carriers to produce a second demodulated signal reads on '796 (see fig. 9, elements 213 and 215; col. 78, lines 56-65).

a time delay for delaying said first demodulated signal with respect to said second demodulated signal reads on '796 (see fig. 9, element 229; col. 59, line 61-col. 60, line 45).

a blend control for selecting one said first and second demodulated signals to be used to produce an output signal reads on '796 (see col. 78, line 66-col. 79, line 3). Selection, not blending, is apparent from this feature.

an output for producing an output signal in response to the selected one of said first and second demodulated signals reads on '796 (see col. 78, lines 60-65).

As per claim 67: a receiver for an in-band on-channel broadcast signal, wherein said first digital signal and said second digital signal represent the same audio information.

As per claim 68: a receiver for an in-band on-channel broadcast signal, wherein:

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The range of frequencies in the reference includes the claimed range of frequencies.

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The range of frequencies in the reference includes the claimed range of frequencies.

As per claim 69: a receiver for an in-band on-channel broadcast signal, wherein said blend control comprises:

a detector for detecting degradation of one said first and second demodulated signals by determining one or more parameters selected from the group consisting of signal-to-noise ratio, bit error rate, signal power level and cyclic redundancy check

reads on '796 (see col. 77, lines 40-61; col. 78, lines 60-65; col. 64, line 47-col. 65, line 8). According to the claimed feature, only one criteria needs to be satisfied at any given time.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 31-34 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar in view of Zegers (US 3,781,795).

As per claim 31: a receiver for an in-band on-channel broadcast signal including a plurality of sub-carriers positioned in upper and lower sidebands with respect to said first carrier and orthogonal frequency division modulated by a digital signal reads on '796 (see fig. 9, elements 213, 215 and 229; col. 26, line 52-col. 27, line 65; col. 58, line 50-col. 59, line 24). Kumar discloses reception and transmission of an in-band on-channel audio broadcasting system and method, using OFDM technique to produce both upper and lower sideband sub-carrier signals along with an analog modulated signal, as depicted in figs. 4 and 9, which are respectively a transmitter and receiver for transmitting and receiving composite signals. Furthermore,

means for demodulating said first carrier to produce a first demodulated signal reads on '796 (see col. 55, lines 36-58; col. 58, lines 7-20; col. 77, line 66-col. 78, line 10).

means for demodulating said plurality of sub-carriers to produce a second demodulated signal reads on '796 (see fig. 9, elements 213 and 215; col. 26, line 31-col. 27, line 12; col. 58, line 50-col. 59, line 24).

means for selecting one said first and second demodulated signals to be used to produce an output signal reads on reads on '796 (see col. 62, lines 13-56; col. 78, line 60-col. 79, line 3).

means for producing an output signal in response to the selected one of said first and second demodulated signals reads on '796 (see col. 78, line 56-col. 793).

But, Kumar does not explicitly teach about delaying said first demodulated signal with respect to said second demodulated signals so as to select one of said first and second demodulated signals for producing an output signal in response to the selected one of the first and the second signals, as claimed by applicant. However, in a related field of endeavor, Zegers in "Error-correcting data transmission system" teaches about a transmission system wherein two versions of the same data are transmitted from a transmitter station to a receiver station via two channels having a mutual time difference, and in which a coded version of the non-delayed data is added to delayed data before transmission as well as after reception (see abstract; col. 1, lines 4-37; col. 15, line 32-col. 16, line 54). Furthermore, an error-correcting circuit, responsive to the indication of a simple error pattern in the first receiver channel is provided for correcting

a digit in the second delay register which is affected by the indicated error pattern (see col. 1, line 53-col. 2, line 3). From Zeger's' teaching one can see that one of the two channels can be analog and the other digital, corresponding to Kumar's analog and digital signals. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Kumar's in-band on-channel audio broadcast system with the teaching of Zegers' for the advantage of correcting an error detected in the second channel with the error pattern detected in the first channel (see col. 1, line 67-col. 2, line 3).

As per claim 32: a receiver for an in-band on-channel broadcast signal, wherein said analog signal and said digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 33: a receiver for an in-band on-channel broadcast signal, wherein:
said first carrier is frequency modulated reads on '796 (see col. 78, lines 35-65). When the two references are combined as shown in the rejection of claim 31, one of the carriers could have been the frequency modulated.

said upper sideband ranges from about 130 kHz to about 199 kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

As per claim 34: a receiver for an in-band on-channel broadcast signal, wherein said means for selecting one said first and second demodulated signals to be used to produce an output signal comprises:

means for detecting degradation of one said first and second demodulated signals by determining one or more parameters selected from the group consisting of signal-to-noise ratio, bit error rate, signal power level and cyclic redundancy check reads on '796 (see col. 77, lines 40-61; col. 78, lines 60-65; col. 64, line 47-col. 65, line 8). According to the claimed feature, only one criteria needs to be satisfied at any given time.

As per claim 45: a receiver for an in-band on-channel broadcast signal including a first carrier modulated by an analog signal, a plurality of sub-carriers positioned in upper and lower sidebands with respect to said first carrier to be broadcast and orthogonal frequency division modulated by a digital signal reads on '796 (see fig. 9, elements 213, 215 and 229; col. 26, line 52-col. 27, line 65; col. 58, line 50-col. 59, line 24).

a demodulator for demodulating said first carrier to produce a first demodulated signal and for demodulating said plurality of sub-carriers to produce a second demodulated signal reads on '796 (see col. 76, line 40-col. 20; col. 77; line 40-col. 78, line 18; col. 78, line 35-col. 79, line 17).

a blend control for selecting one said first and second demodulated signals to be used to produce an output signal reads on '796 (see col. 62, lines 13-56; col. 78, line 60-col. 79, line 3). Since the function of the blend control is provided as a means for selecting one of a first and a second signals, it is interpreted as a selector. In other words, the claim does not show the blend control performing functions more than selecting and hence, cannot be afforded weight more than its function.

an output for producing an output signal in response to the selected one of said first and second demodulated signals reads on '796 (see col. 78, line 56-col. 793). But, Kumar does not explicitly teach about time delaying the first (analog) signal with respect to the second (digital) signal, or time delaying one of the digital or analog signals with respect to each other and selecting one of the first and second demodulated signals, as claimed by applicant. However, in a related field of endeavor, Zegers in "Error-correcting data transmission system" teaches about a transmission system wherein two versions of the same data are transmitted from a transmitter station to a receiver station via two channels having a mutual time difference, and in which a coded version of the non-delayed data is added to delayed data before transmission as well as after reception (see abstract; col. 1, lines 4-37; col. 15, line 32-col. 16, line 54). Furthermore, an error-correcting circuit, responsive to the indication of a simple error pattern in the first receiver channel is provided for correcting a digit in the second delay register which is affected by the indicated error pattern (see col. 1, line 53-col. 2, line 3). From Zeger's' teaching one can see that one of the two channels can be analog and the other digital, corresponding to Kumar's analog and digital signals. Therefore, it would

have been obvious for one of ordinary skill in the art at the time the invention was made to modify Kumar's in-band on-channel audio broadcast system with the teaching of Zegers' for the advantage of correcting an error detected in the second channel with the error pattern detected in the first channel (see col. 1, line 67-col. 2, line 3).

As per claim 46: a receiver for an in-band on-channel broadcast signal, wherein said analog signal and said digital signal represent the same audio information reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly, col. 78, line 56-col. 79, line 3). According to the reference, both the analog and the digital signals (the composite) represent same source information, which is the audio signal.

As per claim 47: a receiver for an in-band on-channel broadcast signal, wherein: said first carrier is frequency modulated reads on '796 (see col. 78, lines 35-65). When the two references are combined as shown in the rejection of claim 31, one of the carriers could have been the frequency modulated.

said upper sideband ranges from about 130 kHz to about i 99 kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

said lower sideband ranges from about -130 kHz to about -199kHz from said first carrier reads on '796 (see col. 26, lines 52-67). The rage of frequencies used in the prior art includes the range of frequencies claimed.

As per claim 48: a receiver for an in-band on-channel broadcast signal, wherein said blend control for selecting one said first and second demodulated signals to be used to produce an output signal comprises:

a signal detector for detecting degradation of one said first and second demodulated signals by determining one or more parameters selected from the group consisting of signal-to-noise ratio, bit error rate, signal power level and cyclic redundancy check reads on '796 (see col. 77, lines 40-61; col. 78, lines 60-65; col. 64, line 47-col. 65, line 8). According to the claimed feature, only one criteria needs to be satisfied at any given time.

Claims 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar in view of Jayant et al. (Jayant) (US 4,291,405).

As per claim 38: a method of receiving a composite signal including a primary broadcast signal and a redundant broadcast signal having a lower quality or a lower data rate than the primary broadcast signal and being delayed in time with respect to the primary signal, the method comprising the steps of;

receiving the composite signal and separating the composite signal into the primary broadcast signal and the redundant broadcast signal reads on 796 (see col. 55, lines 36-col. 56, line 37). Either of the upper or lower sideband can be labeled as a primary broadcast signal. But, Kumar does not explicitly teach about, initially using the redundant broadcast signal to produce an output and blending the output signal from the redundant broadcast signal to the primary broadcast when the primary broadcast signal signals is degraded, as claimed by applicant. However, in a related field of endeavor, Jayant teaches about reducing error in a digital channel transmission and reception wherein a receiver detects a corrupted signal and in response, uses a technique of modifying the corrupted signal with a redundant replica of a second signal

transmitted at a transmission site (see col. 2, line 27-col. 3, line 6; col. 3, line 57-col. 4, line 52). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Kumar's receiver with the teaching of Jayant for the advantage of modifying a degraded/corrupted signal with a replica of the same signal as provided in Jayant's teaching.

As per claim 39: the method, wherein:

the primary broadcast signal comprises a digital signal reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly col. 78, lines 56-65). Any of the composite signals could be labeled as primary signal.

and the redundant broadcast signal comprises an analog signal reads on '796 (see col. 78, lines 35-col. 79, line 3, particularly col. 78, lines 56-65). Any of the composite signals could be labeled as a redundant signal.

As per claim 40: the method, wherein:

the primary broadcast signal comprises a first digital signal reads on '796 (see col. 26, lines 31-64; col. 29, lines 30-65). Any of the upper or lower sideband can be a primary broadcast signal.

and the redundant broadcast signal comprises a second digital signal having a lower data rate than said first digital signal reads on '796 (see col. 26, lines 31-64; col. 29, lines 30-65). Any of the upper or lower sideband can be a redundant broadcast signal.

As per claim 41: The method, further comprising the step of using the redundant broadcast signal to tune the receiver to a channel of interest reads on '796 col. 77, line 62-col. 78, line 2). The receiver has to tune to the FM analog signal.

Allowable Subject Matter

Claims 37 and 55-62 are allowed.

The following is an examiner's statement of reasons for allowance:

As per claims 37, 55-58 and 59-62, the claims are directed to in-band on-channel signal broadcasting. The prior art of record does not teach or fairly suggest the embodiment and method steps recited in those claims..

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 7/2/04 have been fully considered but they are not persuasive. Applicants argument and examiner's responses are provided as shown below.

Argument I: with regard to claim 21, 24, 31, 34, 42, 45, 48, applicant argues by saying Kumar (US 5,949,796) does not delay the analog signal with respect to the digital signal as required by the amended claim 21. But, admits that Kumar delays the analog signal with respect to the digital signal as require by the pre-amended claim 21.

Response I: examiner considers that it is the delaying of one signal with respect to another that carries a patentable weight, but not whether one of those signal is analog or digital, since analog and digital signals are known to be convertible to each other. To that effect, Kumar discloses the technique of delaying one signal with respect to another, as admitted by applicants.

Argument II: again with respect to claims 21, 24 applicants argue by saying Kumar neither disclose nor suggest any time diversity between an analog and digital signal, but, rather discloses time diversity between digital signals in the upper and lower sidebands.

Response II: examiner respectfully disagrees with the argument and would like to further refer applicant to the abstract of Kumar.

Argument III: with regard to claims 22, 25, 28, 32, 43, 46, 50, 53, 64 and 67, applicant asserts that Kumar neither discloses nor suggests that the analog and digital signals represent same audio information.

Response III: examiner respectfully disagrees with the argument. Kumar's (see abstract) selection of either the upper or lower sideband signals prior to decoding; or substantially redundant encoded source bit information (see col. 27, lines 49-53) indicates that both the upper and lower sidebands contain same information.

Argument IV: first examiner would like to point out that claim 22 has been typographically mistaken for claim 23 (see claim 23 argument paragraph). Regarding claims 23, 26, 29, 33, 44, 47, 51, 54, 65 and 68, applicants' assert that Kumar's showing of upper sidebands at 100 kHz to 200 kHz from the channel center frequency and lower sidebands at –100 kHz to –200 kHz from the center is different from that of applicants which is +/- 130 kHz to about +/- 199 kHz from the center. The argument concludes by saying that Kumar's range of sidebands does restrict the sidebands to avoid interference, as does the claimed range.

Response IV: examiner respectfully disagrees with the argument. First, the restricting feature, for avoiding interference, is not clear from the above cited claims as such. Furthermore, the cited claims simply recite sideband ranges which are comprised by the range of Kumar's sidebands.

Argument V: with regard to claim 27 applicants argue by saying Kumar does not disclose or suggest the step of selecting one of the first and second demodulated signals to be sued to produce an output signal.

Response V: examiner respectfully disagrees with the argument. In that Kumar, as admitted by applicants, discloses/teaches selection between the upper and lower sidebands both of which are digital. But, the fact that whether one of the signals is digital and the other is analog, does not carry patentable weight since converting analog signal to digital and digital to analog using (A/D and D/A) is well known and dependent upon the work at hand and/or design choice.

Argument VI: with regard to claim 30 applicant asserts that Kumar does not disclose /teach about producing an output signal that comprises the steps of: detecting degradation of one of the first and second demodulated signals by determining one or more parameters selected from the group consisting of signal –to-noise ratio, bit rate, signal power level and cyclic redundancy check.

Response VI: examiner respectfully disagrees with the argument. As pointed out in the rejection, claim 30 calls for determination of one or more parameters, which is satisfied by Kumar's SNR. Please refer to the rejection of claim 30 above.

Argument VII: with regard to claims 35, 36, 49, 52, 63, 66 and 69, applicants argue by saying Kumar neither discloses nor suggests anything about relative data rates of the two digital broadcast signals, or that a second digital broadcast signal has lower data rate than the first digital broadcast signal.

Response VII: examiner respectfully disagrees with the argument. In that it is known that data rate is a measure of digital signal quality and the reason Kumar makes selection is that one of the sideband digital signals are degraded. Furthermore, Kumar

discloses that in OFDM modulation, certain sub-carriers, having very narrow bandwidth, may be significantly attenuated (see col. 47, lines 24-44).

Argument VIII: with respect to claims 38-40, applicants argue saying Kumar in view of Jayant do not disclose or suggest the steps of, initially using the redundant broadcast signal to produce an output signal; and blending the output from the redundant broadcast signal to the primary broadcast signal.

Response VIII: examiner respectfully disagrees with the argument. Kumar discloses the reception and selection of a composite signal wherein one is selected when the other is degraded (see at least abstract). Furthermore, Jayant teaches about reducing error in a digital channel transmission and reception wherein a receiver detects a corrupted signal and in response, uses a technique of modifying the corrupted signal with a redundant replica of a second signal transmitted at a transmission site (see col. 2, line 27-col. 3, line 6; col. 3, line 57-col. 4, line 52). In other words, the teaching Jayant, as examiner understands it, is a technique of patching one signal with another wherein both of the signals are transmitted and received as a composite signal.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N Zewdu whose telephone number is (703) 306-5418. The examiner can normally be reached on 8:30 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (703) 308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Meless Zewdu

Examiner

27 September 2004.

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600